

## **CLAIMS**

What is claimed is:

- 1 1. An arrangement adapted for optical communication between first and second nodes,  
2 the optical communication arrangement comprising:  
3 a first optical switch having first-switch transmit and receive channels and a second  
4 optical switch having second-switch transmit and receive channels, at least one of the first  
5 and second optical switches adapted to conduct a self-test and indicate whether the self-test  
6 has failed;  
7 an optical coupler adapted to receive the first-switch and second-switch transmit  
8 channels and to provide an output for transmit to at least one of the first and second nodes;  
9 an optical splitter adapted to receive an optical signal coupled from at least one of the  
10 first and second nodes and to provide an output coupled to the first-switch and second-switch  
11 receive channels; and  
12 a control circuit configured and arranged to activate one of the first and second  
13 optical switches in response to the other of the first and second optical switches conducting  
14 the self-test.
- 1 2. The arrangement of claim 1, wherein the control circuit includes a first controller of  
2 the first optical switch and a second controller of the second optical switch.
- 1 3. The arrangement of claim 2, wherein each of the first and second controllers is  
2 configured and arranged to bi-directionally communicate with the other of the first and  
3 second controllers and to establish only one of the first and second controllers being active.
- 1 4. The arrangement of claim 3, wherein the first optical switch includes the first  
2 controller and the second optical switch includes the second controller.
- 1 5. The arrangement of claim 2, wherein the second controller is adapted to activate the  
2 second optical switch upon receiving a signal from the first controller that the first optical  
3 switch is in a failure mode.

1 6. The arrangement of claim 2, wherein said one of the first and second optical switches  
2 activates in response to neither of the first and second optical switches indicating that the  
3 self-test has failed.

1 7. The arrangement of claim 1, wherein the control circuit is further configured and  
2 arranged to activate one of the first and second optical switches in response to the other of  
3 the first and second optical switches indicating that the self-test has failed.

1 8. An arrangement adapted for optical communication with a first node comprising:  
2 a first optical switch having first-switch transmit and receive channels and a second  
3 optical switch having second-switch transmit and receive channels, at least one of the first  
4 and second optical switches adapted to conduct a self-test and indicate whether the self-test  
5 has failed;  
6 an optical coupler adapted to receive the first-switch and second-switch transmit  
7 channels and to provide an output for transmit to the first node;  
8 an optical splitter adapted to receive an optical signal coupled from the first node and  
9 to provide an output coupled to the first-switch and second-switch receive channels; and  
10 a control circuit configured and arranged to activate one of the first and second  
11 optical switches in response to the other of the first and second optical switches conducting  
12 the self-test.

1 9. The arrangement of claim 8, further comprising:  
2 a second optical coupler adapted to receive the first-switch and second-switch  
3 transmit channels and to provide an output for transmit to a second node; and  
4 a second optical splitter adapted to receive an optical signal coupled from the second  
5 node and to provide an output coupled to the first-switch and second-switch receive channels.

1 10. The arrangement of claim 9, wherein the control circuit is further configured and  
2 arranged to activate one of the first and second optical switches in response to the other of  
3 the first and second optical switches indicating that the self-test has failed.

1 11. The arrangement of claim 9, wherein said one of the first and second optical switches  
2 activates in response to neither of the first and second optical switches indicating that the  
3 self-test has failed.

1 12. The arrangement of claim 9, wherein the control circuit includes a first controller of  
2 the first optical switch and a second controller of the second optical switch.

1 13. An arrangement adapted for optical communication between first and second nodes,  
2 the optical communication arrangement comprising:

3 first optical communication means having first-switch transmit and receive channels  
4 and second optical communication means having second-switch transmit and receive  
5 channels, each of the transmit and receive communication means for respectively sending  
6 and receiving optical signals and at least one of the first and second optical communication  
7 means for conducting a self-test and indicating whether the self-test has failed;

8 optical coupling means for receiving the first-switch and second-switch transmit  
9 channels and for providing an output to transmit to at least one of the first and second nodes;

10 optical splitting means for receiving an optical signal coupled from at least one of the  
11 first and second nodes and for providing an output coupled to the first-switch and second-  
12 switch receive channels; and

13 control means for activating one of the first and second optical communication means  
14 in response to the other of the first and second optical communication means conducting the  
15 self-test.

1 14. The arrangement of claim 13, wherein the control means includes means for  
2 activating one of the first and second optical communication means in response to a pre-  
3 programmed default mode for said one of the first and second optical communication means  
4 and in response to neither of the first and second optical communication means indicating  
5 that the self-test has failed.

1 15. The arrangement of claim 13, wherein the output of said optical coupling means  
2 transmits to the first node and said optical splitting means receives an optical signal coupled  
3 from the first node.

1 16. The arrangement of claim 15, further comprising:  
2 second optical coupling means for receiving the first-switch and second-switch  
3 transmit channels and for providing an output for transmit to a second node; and  
4 a second optical splitting means for receiving an optical signal coupled from the  
5 second node and for providing an output coupled to the first-switch and second-switch  
6 receive channels.

1 17. In an arrangement for optical communication between first and second nodes, a first  
2 node comprising:

3 a first optical switch having first-switch transmit and receive channels and a second  
4 optical switch having second-switch transmit and receive channels, at least one of the first  
5 and second optical switches adapted to conduct a self-test and indicate whether the self-test  
6 has failed;

7 an optical coupler adapted to receive the first-switch and second-switch transmit  
8 channels and to provide an output for transmit to the first node from a second node;

9 an optical splitter adapted to receive an optical signal coupled from the first node and  
10 to provide an output coupled to the first-switch and second-switch receive channels for the  
11 second node; and

12 a control circuit configured and arranged to activate one of the first and second  
13 optical switches in response to the other of the first and second optical switches conducting  
14 the self-test.

1 18. In an arrangement for optical communication between first and second nodes, a first  
2 node comprising:

first optical communication means having first-switch transmit and receive channels and second optical communication means having second-switch transmit and receive channels, each of the transmit and receive communication means for respectively sending and receiving optical signals and at least one of the first and second optical communication means for conducting a self-test and indicating whether the self-test has failed;

optical coupling means for receiving the first-switch and second-switch transmit channels and for providing an output to transmit to the first node from the second node;

optical splitting means for receiving an optical signal coupled from the first node and for providing an output coupled to the first-switch and second-switch receive channels for the second node; and

control means for activating one of the first and second optical communication means in response to the other of the first and second optical communication means conducting the self-test.

19. In the arrangement of claim 18, wherein the control means includes means for activating one of the first and second optical communication means in response to a pre-programmed default mode for said one of the first and second optical communication means.

20. In the arrangement of claim 19, wherein the control means includes means for activating one of the first and second optical communication means in response to neither of the first and second optical communication means indicating that the self-test has failed.